

BEREZOVSKIY, A.Z., inzh.; GORVITS, A.A.

D-535 bulldozer based on the T-75 tractor. Stroi.i dor.mash. 6  
no.8:8-9 Ag '61. (MIRA 14:8)

(Bulldozers)

GORVITS, I.M., inzh.

The MASHG instrument for repeated stretching of seams. Izv. vys.  
ucheb. zav.; tekhn.leg. prom. no.2:131-136 '58. (MIRA 11:6)

1.Kiyevskiy tekhnologicheskoy institut legkoy promyshlennosti.  
(Testing instruments)

AFANAS'YEV, O.O. [Afanas'iev, O.O.]; GORVITS, S.M. [Horvits, S.M.];  
IGNATOVA, L.P. [Ihnatova, L.P.]; KOTOV, M.P.; NOVIK, G.B.  
[Novyk, H.B.]; ORLOV, I.V.; PEYSAKHZON, L.B.; ROZENMAN, O.S.  
[Rozenman, H.S.]; SKATERNY, V.A.; TSITRIN, L.I.; CHECHENEV,  
M.I. [Checheniev, M.I.]; SHOSTAK, S.I.; NAZARENKO, N., red.;  
GORKAVENKO, L. [Horkavenko, L.], tekhn.red.

[Light industry of the Ukraine] Lehka promyslovist' Ukrainy.  
Kyiv, Derzh.vyd-vo tekhn.lit-ry URSR, 1960. 197 p.

(MIRA 14:4)

(Ukraine--Industries)

GORYA, V. S., Candidate of Biol Sci (diss) -- "The disease-resistance of new forms of wheat in the collection of the VIR in the Kuban' and in Dagestan". Leningrad, 1959. 16 pp (All-Union Order of Lenin Acad Agric Sci im V. I. Lenin, All-Union Inst of Plant Growing), 150 copies (KL, No 20, 1959, 110)

GORYA, V.S.

Leaf rust resistance of soft wheat at various development stages  
of the host plant. Dokl. Akad. sel'khoz. 24 no.5:34-37 '59.  
(MIRA 12:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut rasteniye-  
vodstva. Predstavlena akademikom P.M. Zhukovskim.  
(Leaf rust of wheat)

GORYACHAYA, M. M.

ZAYTSEV, I. L.; BARANENKOV, G. S., redaktor; KAVERIN, N. A., redaktor;  
GORYACHAYA, M. M., redaktor; TUMARKINA, N. A., tekhnicheskii  
redaktor

[Course in higher mathematics for technical schools] Kurs vysshei  
matematiki dlia tekhnikov. Pod red. G. S. Baranenkova. Moskva, Gos.  
izd-vo tekhniko-teoret. lit-ry, 1954. 356 p. [Microfilm] (MIRA 8:3)  
(Geometry, Analytic) (Calculus, Differential)  
(Calculus, Integral)

VITUSHKIN, Anatoliy Georgiyevich; ~~GORYACHAYA, M.M.~~, redaktor;  
GAVRILOV, S.S., tekhnicheskii redaktor.

[High-dimensional variations] O mnogomernykh variatsiakh.  
Moskva, Gos.isd-vo tekhniko-teoret.lit-ry, 1955. 220 p.  
(Calculus of variations) (MLRA 8:12)

KHINCHIN, Aleksandr Yakovlevich; GORYACHAYA, M.M., redaktor; AKHIZOV,  
S.N., tekhnicheskii redaktor.

[Short course in mathematical analysis] Kratkii kurs matematicheskogo analiza. Izd-2-e. Moskva, Gos.izd-vo tekhniko-teoret. lit-ry, 1955. 627 p. (MLRA 8:8)  
(Calculus)



GORYPACHAYE, D.M.

RYAREN'KIY, Viktor Solomonovich; FILIPPOV, Aleksey Fedorovich; CHUDOVA, L.A.,  
redaktor; GORYACHEYA, M.M., redaktor; TUMARKINA, N.A., tekhnicheskiy  
redaktor

[Stability of difference equations] Ob ustoychivosti raznostnykh  
uravnenii. Pod red. L.A. Chudova. Moskva, Gos. izd-vo tekhniko-  
teoret. lit-ry, 1956. 171 p. (MIRA 10:4)  
(Difference equations)

SHILOV, Georgiy Yevgeniyevich; GORYACHAYA, M.M., redaktor; GAVRILOV, S.S.,  
tekhnicheskii redaktor

[Introduction to the theory of linear spaces] Vvedenie v teoriyu  
lineinykh prostranstv. Izd. 2-oe. Moskva, Gos. izd-vo tekhniko-teoret.  
lit-ry, 1956. 303 p. (MLRA 9:11)  
(Geometry, Algebraic)

ZAYTSEV, Ivan Lazarevich; BARANENKOV, G.S., redaktor; KAYKIN, N.A.,  
redaktor; GORYACHAYA, M.M., redaktor; TUMARKINA, N.A., tekhnicheskii redaktor

[A course in higher mathematics for technical schools] Kurs vysshei matematiki dlia tekhnikumov. Pod red. G.S.Baranenkova. Izd. 2-oe, ispr. Moskva, Gos. izd-vo tekhniko-teoret. lit-ry, 1956. 340 p. (MLRA 9:8)  
(Mathematics)

KRASNOSEL'SKIY, Mark Aleksandrovich; GORYACHAYA, M.M., redaktor; TUMARKINA, N.A., tekhnicheskiy redaktor.

[Topologic methods in the theory of nonlinear integral equations]  
Topologicheskie metody v teorii nelineynykh integral'nykh uravnenii.  
Moskva, Gos.izd-vo tekhniko-teoret. lit-ry, 1956. 392 p. (MIRA 9:6)  
(Integral equations)

TARASOV, Nikolay Petrevich; GORYACHAYA, M.M., redaktor; GAVRILOV, S.S.,  
tekhnicheskii redaktor.

[Course in higher mathematics for technical schools] Kurs vysshei  
matematiki dlia tekhnikumov. Izd. 9-ee, perer. Moskva, Gos. izd-vo  
tekhniko-teoret. lit-ry, 1956. 404 p. (MLBA 9:6)  
(Calculus) (Geometry, Analytic)

KORDENSKIY, Boris Anastas'yevich; GORYACHAYA, M.M., redaktor; AKHLAMOV,  
S.N., tekhnicheskii redaktor

[Sharpness in mathematics] Matematicheskaya smekalka. Izd. 3-e.  
Moskva, Gos. izd-vo tekhniko-teoret. lit-ry, 1956. 574 p. (MIRA 9:11)  
(Mathematical recreations)

*GORYACHAYA M.M.*  
TRAKHTENBROT, Boris Avraamovich; GORYACHAYA, M.M., red.; YERMAKOVA, Ya.A.,  
tekhn.red.

[Algorithms and mechanical solution of problems] Algoritmy i  
mashinnoe reshenie zadach. Moskva, Gos. izd-vo tekhniko-teoret.  
lit-ry, 1957. 94 p. (Populiarnye lektsii po matematike, no.26)  
(Calculating machines) (MIRA 11:4)  
(Algorism)

GORYACHAYA, M. M.

PHASE I BOOK EXPLOITATION

16

Yaglom, A. M., and Yaglom, I. M.

Veroyatnost' i informatsiya (Probability and Information) Moscow, GIFML,  
1957. 159 p. 30,000 copies printed.

Ed.: Goryachaya, M. M.; Tech. Ed.: Gavrilov, S. S.; Reviser: Moiseyeva, Z. V.

PURPOSE: The book is designed for people without higher mathematical education. The authors' main task was to acquaint the general reader with certain not-too-complicated, but very important mathematical concepts and their application in modern engineering.

COVERAGE: The fundamentals of the classic theory of probability and the general concept of probability in connection with Boolean algebra are presented. The concepts of entropy and information are introduced and their mathematical formulation given. The importance of the concepts of entropy and information is illustrated by certain logical problems. The concepts of a code and of its economy are introduced.

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### Probability and Information

The binary code is described and its economy studied. The binary code is extended into the code of  $n$  signals. Special attention is paid to the Shannon-Fano Code and to Shannon's work in information theory. The fundamentals of the Shannon-Fano Code and its efficiency are demonstrated. The transmission of a message, when communication line disturbances are present is discussed. The concepts of the speed of transmission and the carrying capacity of communication lines are introduced and formulas given. No proofs are given for the formulas and only one individual case given by A. N. Kolmogorov is studied. There are 8 references mentioned in the introduction and in footnotes, 7 of which are Soviet and 1 English. In the introduction the authors thank Academician A. N. Kolmogorov for his valuable advice. They also thank editor M. M. Goryachaya for her remarks concerning the arrangement of the book material.

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Probability and Information

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Ch. I. Probability

1. Definition of probability
2. Properties of probability. Sum and product of events.  
Incompatible and independent events
3. Conditional probabilities
4. Algebra of events and the generalized definition of probability

Ch. II. Entropy and Information

1. Entropy as a measure of degree of indefiniteness
2. Entropy of compound events. Conditional entropy
3. Concept of information
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2. Shannon-Fano code
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Appendix I. Properties of Convex Functions

137

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27 June 1958

*GORYACHAYA, M. M.*

LYUBARSKIY, Grigoriy Yakovlevich; GORYACHAYA, M.M., red.; GAVRILOV, S.S.,  
tekh.n.red.

[Theory of groups and its use in physics] Teoriia grupp i ee  
primeneniye v fizike. Moskva, Gos.izd-vo tekhniko-teoret. lit-ry.  
1957. 354 p. (MIRA 11:3)  
(Groups, Theory of)

GORYACHAYA, M.M.

KOZHENUROV, Pavel Yakovlevich; GORYACHAYA, M.M., redaktor; NEGRIMOVSKAYA, R.A.,  
tekhnicheskiiy redaktor

[A course in trigonometry for engineering schools] Kurs  
trigonometrii dlia tekhnikumov. Izd. 4-oe, stereotip. Moskva, Gos.  
izd-vo tekhniko-teoret. lit-ry, 1957. 336 p. (MLRA 10:5)  
(Trigonometry)

*Goryachaya M.M.*

PHASE I BOOK EXPLOITATION

9

: Khinchin, A. Ya.

Kratkiy kurs matematicheskogo analiza (Brief Course in Mathematical Analysis)  
Moscow, GITTI, 1957. 627 p. 50,000 copies printed.

Ed. : Goryachaya, M. M.; Tech. Ed.: Akhlatov, S. N.; Reviser: Yemel'yanova, S. N.

PURPOSE: The textbook is designed for students of the mechanics-mathematics and physics-mathematics faculties of universities and pedagogical institutes. The author's main task was to prepare a textbook which would not only satisfy the course requirements but would be on the modern scientific level.

COVERAGE: The book covers the basic concepts of numbers, functions, and limits, the elements of differential integral calculus, the basic theory of series, and the expansion of differential and integral calculus for the functions of several arguments. In the preface to the first edition the author thanks members of the departments of mathematical analysis of the Moscow, Leningrad and Kiev universities for their remarks and advice. Special gratitude is expressed to Prof. Tumarkin, L. A. (Moscow), Prof. Shilov, G. Ye. and to the editor, Golovin, O. N.

~~Card 1/1~~

Brief Course in Mathematical Analysis

9

In the preface to the second edition, the author thanks the members of the Department of Mathematical Analysis of Rostov University (Department Head Prof. Gachov, F. D.) for criticism of the first edition of the book and to Academician Kolmogorov, A. N., and Prof. Myshkis, A. D. (Minsk) for pointing out certain errors. The author thanks Demidovich, B. P. for the preparation of the subject index. There is no bibliography.

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KRASNOSEL'SKIY, Mark Aleksandrovich; RUTITSKIY, Yakov Bronislavovich;  
GORVACHAYA, M.M., red.; KRYUCHKOVA, V.N., tekhn.red.

[Convex functions and Orlicz spaces] Vypuklye funktsii i  
prostranstva Orlicha. Moskva, Gos. izd-vo fiziko-matematicheskoi  
lit-ry, 1958. 271 p. (MIRA 11:12)  
(Functional analysis)



LYUBARSKIY, Grigoriy Yakovlevich; GORYACHAYA, M.M., red.; YERMAKOVA,  
Ye.A., tekhn.red.

[Theory of groups and its use in physics] Teoriia grupp i ee  
primeneniye v fizike. Moskva, Gos.izd-vo fiziko-matem.lit-ry, 1958.  
354 p. (MIRA 12:4)

(Groups, Theory of)

VITUSHKIN, Anatoliy Georgiyevich; ANTONOVSKIY, M.Ya., red.; GORVACHAYA,  
M.M., red.; GAVRILOV, S.S., tekhn.red.

[Evaluating the complexity of the problem of tabulating]  
Otsenka slozhnosti zadachi tabulirovaniya. Moskva, Gos.izd-vo  
fiziko-matem.lit-ry, 1959. 228 p. (MIRA 13:2)  
(Mathematics--Tables)

KITOV, Anatoliy Ivanovich; KRINITSKIY, Nikolay Andreyevich; GORYACHAYA,  
M.M., red.; ORLOV, V.B., red.; GAVRILOV, S.S., tekhn.red.

[Electronic digital computers and their programming] Elektronnyye  
tsifrovye mashiny i programmirovaniye. Moskva, Gos.izd-vo fiziko-  
matem.lit-ry, 1959. 572 p. (MIRA 13:4)  
(Electronic digital computers)  
(Programming (Electronics))

KOZHEUROV, Pavel Yakovlevich; GORYACHAYA, M.M., red.; BRUDNO, K.F.,  
tekhn.red.

[Trigonometry] Trigonometriia. Izd.2. Moskva, Gos.izd-vo  
fiziko-matem.lit-ry, 1960. 336 p.  
(Trigonometry)

(MIRA 14:1)

KALNIN, Robert Avgustovich; GORYACHAYA, M.M., red.; MURASHOVA, N.Ya.,  
tekhn.red.

[Algebra] Algebra. Ind.5. Moskva, Gos.izd-vo fiziko-matem.  
lit-ry, 1960. 320 p. (MIRA 14:4)  
(Algebra)

VYGODSKIY, Mark Yakovlevich; GORYACHAYA, M.M., red.; KRYUCHKOVA, V.M.,  
tekhn.red.

[Elementary mathematics handbook; tables, arithmetic, algebra,  
geometry, trigonometry, functions, and graphs] Spravochnik po  
elementarnoi matematike; tablitsy, arifmetika, algebra, geo-  
metriia, trigonometriia, funktsii i grafiki. Izd.13, stereo-  
tipnoe. Moskva, Gos.izd-vo fiziko-matem.lit-ry, 1960. 412 p.  
(MIRA 13:11)

(Mathematics)

GORYACHAYA, M. M.

PADDNYEV, Dmitriy Konstantinovich; SOMINSKIY, Il'ya Samuilovich; GO-  
RYACHAYA, M.M., red.; MURASHOVA, N.Ya., tekhn. red.

[Algebra for self-instruction] Algebra dlia samoobrazovaniia.  
Moskva, Gos. izd-vo fiziko-matem. lit-ry, 1960. 529 p.  
(MIRA 14:5)

(Algebra)

VILENKIN, Naum Yakovlevich; GORYACHAYA, M.M., red.; PLAKSHE, L.Yu., tekhn.  
red.

[Method of successive approximations] Metod posledovatel'nykh pribli-  
zhenii. Moskva, Gos. izd-vo fiziko-matem. lit-ry, 1961. 63 p.

(MIRA 14:9)

(Approximate computation)



VOROB'YEV, N.N., red.; GORYACHAYA, M.M., red.; KRYUCHKOVA, V.N.,  
tekhn. red.

[Matrix games] Matrichnye igry. Moskva, Gos. izd-vo fiziko-  
matem. lit-ry, 1961. 280 p. Translated articles.

(MIRA 15:3)

(Games of strategy (Mathematics))

KRASNOSEL'SKIY, Mark Aleksandrovich. Prinimal uchastiye BAKEL'MAN,  
I.Ya.; GORYACHAYA, M.M., red.; LIKHACHEVA, L.V., tekhn. red.

[Positive solutions to operator equations in the theory of non-  
linear analysis] Polozhitel'nye resheniya operatornykh uravnenii  
glavy nelineinogo analiza. Moskva, Gos.izd-vo fiziko-matem.lit-ry  
1962. 394 p. (MIRA 15:7)  
(Equations) (Operators (Mathematics))

BEREZIN, Ivan Semenovich; ZHIDKOV, Nikolay Petrovich; GORYACHAYA,  
M.M., red.; AKSEL'ROD, I.Sh., tekhn. red.

[Calculation methods]Metody vychislenii. Izd.2., perer.  
Moskva, Fizmatgiz. Vol.2. 1962. 635 p. (MIRA 15:11)  
(Numerical calculations)

YAGLOM, Isaak Moiseyevich; GORYACHAYA, M.M., red.; MOROZOVA, I.Ye.m  
red.; AKSEL'ROD, ~~AKSEL'ROD~~ red.

[Complex numbers and their use in geometry] Kompleksnye  
chisla i ikh primeneniye v geometrii. Moskva, Fizmatgiz,  
1963. 191 p. (MIRA 16:9)  
(Numbers, Complex) (Geometry, Non-Euclidean)

KORDEMSKIY, Boris Anastas'yevich; GORYACHAYA, M.M., red.;  
KRYUCHKOVA, V.N., tekhn. red.

[Mathematical problems and games] Matematicheskaya smekal-  
ka. Izd.7., perer. Moskva, Fizmatgiz, 1963. 566 p.  
(MIRA 16:5)

(Mathematics--Problems, exercises, etc.)

YUDIN, David Borisovich; GOL'SHTEYN, Ye.G.; MOVSHOVICH, S.M., red.;  
GORYACHAYA, M.M., red.; MURASHOVA, N.Ya., tekhn.red.

[Linear programming; theory and finite methods] Lineinoe  
programmirovaniye; teoriya i konechnye metody. Moskva,  
Fizmatgiz, 1963. 775 p. (MIRA 17:2)

SOMINSKIY, Il'ya Samuilovich; GOFYACHAYA, M.M., red.; KRYUCHKOVA,  
V.N., tekhn. red.

[Elementary algebra; supplementary course] Elementarnaya  
algebra; dopolnitel'nyi kurs. Moskva, Fizmatgiz, 1963.  
200 p. (MIRA 17:2)

GNEDENKO, Boris Vladimirovich; KHINCHIN, Aleksandr Yakovlevich;  
GORYACHAYA, M.M., red.

[Elementary introduction to the theory of probability]  
Elementarnoe vvedenie v teoriu veroiatnostei. Izd.6.  
Moskva, Nauka, 1964. 142 p. (MIRA 18:5)



MIRONOV, Georgiy Akimovich; KRINIISKIY, N.A., red.; GORYACHAYA,  
M.M., red.

[Test programs for checking electronic digital computers]  
Ispytatel'nye programmy dlia kontrolya elektronnykh tsif-  
rovykh mashin. Moskva, Izd-vo "Nauka," 1964. 267 p.  
(MIRA 17:6)

BUKHTIYAROV, Aleksey Mikhaylovich; ZIKEVSKAYA, Lidiya Mikhaylovna;  
FROLOV, Gennadiy Dmitriyevich; KRINITSKIY, N.A., red.;  
GORYACHAYA, M.M., red.

[Collection of problems in programming with answers and  
solutions] Sbornik zadach po programmirovaniyu s otvetami  
i resheniyami. Moskva, Nauka, 1965. 410 p.

(MIRA 18:11)

PAPERNOV, Abram Aleksandrovich; GORYACHAYA, M.M., red.

[Logical principles of digital computers and programming ]  
Logicheskie osnovy tsifrovyykh mashin i programmirovaniia.  
Moskva, Nauka, 1965. 560 p. (MIRA 18:7)

BRUDNO, Aleksandr L'vovich; GORYACHAYA, M.M., red.

[Introduction to programming in symbols according to  
content] Vvedenie v programmirovaniye v sodержatel'-  
nykh oboznacheniiakh. Moskva, Nauka, 1965. 147 p.  
(MIRA 18:11)

DEMIN, M.N.; IGONIN, V.M.; GORVACHENKO, N.A.; TRINKIN, N.R.; YANTOVSKIY, I.A.;  
TRUBIN, A.K.

Coating leather for uppers with nitro dye solutions at high  
temperatures. Kozh.-obuv.prom.3 no.4:13-15 Ap '61. (MIRA 14:5)  
(Dyes and dyeing—Leather)

L 00079-07 EWT(m) JR

ACC NR: AP6034093

SOURCE CODE: UR/0089/66/021/004/0267/0271

AUTHOR: Goryachenko, V. D.

ORG: none

TITLE: Stability of a nuclear reactor with a circulating fuel without delayed neutrons

SOURCE: Atomnaya energiya, v. 21, no. 4, 1966, 267-271

TOPIC TAGS: circulating fuel reactor, reactor control, reactor neutron flux, control system stability, nuclear reactor characteristic

ABSTRACT: The article is devoted to investigation of the stability of a circulating-fuel reactor model with distributed parameters, neglecting the delayed neutrons but taking into account the spatial distribution of the variables along the reactor core. The main purpose of the investigation was to check the feasibility of self-regulation in such a reactor under conditions when the time that the fuel spends inside the core is much smaller than the time outside the core. It is assumed that the self-regulation is effected by a negative temperature coefficient of reactivity, the heat released in the core is proportional to the neutron density, and that the energy balance is governed essentially by the change in the heat energy. A sinusoidal distribution of the neutron density along the core is postulated. The characteristic equation for the core is written out and is linearized in the vicinity of the equilibrium. For a reactor with distributed parameters the main cause of instability is either a large

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UDC: 621.039.56: 621.039.514

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ACC NR: AF6034093

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value of negative temperature coefficient of reactivity, or a large temperature drop in the fuel in the core (or both). The analysis of the characteristic equation shows that the delayed neutrons exert a favorable influence on the stability, but the stability region itself is small and instability can set in as a result of small changes in the reactor parameters. It is shown in addition that Welton's sufficiency criterion for reactor stability (Proc. of the Internat. Conf. on the Peaceful Uses of Atomic Energy, Geneva, 1955, v. 5, p. 377 [English edition]) is not applicable to a reactor with circulating fuel. The deductions are only qualitative, and quantitative characteristics of the influence of the delayed neutrons on the stability can be obtained only by using a more precise model. The author thanks N. A. Zheleztsov and Ye. F. Sabayev for valuable remarks and interest in the work. Orig. art. has: 3 figures and 25 formulas.

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ATD PRESS: 5102

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OTH REF: 005/

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ACC NR: AP6024534

SOURCE CODE: UR/0089/66/021/001/0003/0006

AUTHOR: Goryachenko, V. D.

3/

ORG: none

19

TITLE: Stability of nuclear power plant with circulating fuel

SOURCE: Atomnaya energiya, v. 21, no. 1, 1966, 3-6

TOPIC TAGS: circulating fuel reactor, nuclear reactor characteristic, nuclear reactor core

ABSTRACT: The dynamics of a nuclear power plant with a circulating incompressible fuel is analyzed. It is assumed that the reactor core represents a system with lumped parameters, and the heat exchanger is a unit with distributed parameters. A linearized system of equations for the reactor dynamics is derived and the conditions for reactor stability are established. The author thanks N. A. Zheleztsov and Ye. F. Sabayev for their comments on the work. Orig. art. has: 1 figure and 25 formulas.

[AS]

SUB CODE: 18/ SUBM DATE: 08Dec65/ ORIG REF: 004/ OTH REF: 006/ ATD PERS: 5048

Card 1/141P

UDC: 621.039.515



*GORYACHENKO, A. T.*  
SOKOLOV, T.N.; ~~GORYACHENKO~~, A.T.

Problem of quality indices of servomechanisms. Trudy LPI no.181:131-  
148 '55. (MLRA 10:1)

(Servomechanisms)

ALEXANDROV, I.A.; KOPYACHNIKOV, V.G.; YEREMENKO, V.S.; KORNEEV, Ya.F.;  
KHALIF, A.I.

Obtaining liquefied gas in the refining of oil on the pressure  
and vacuum distillation units of petroleum plants. Gaz. prom. 8  
no.11:48-50 '63. (MIRA 17:11)

CORYACHENKOVA, Ye. V.

"On the Intermediary Metabolism of l-Tryptophan," *Biochim.*, 8, No.1, 1943

Lab. Metabolic Research, VIEM

USSR/Medicine - Pyridoxine Mar/Apr 49  
Medicine - Alanine Compounds

"Enzymatic Formation of Alanine From Levo-kynurenine and Levotryptophane and the Role of Vitamin B<sub>6</sub> in This Process," A. Ye. Braunshteyn, Ye. V. Goryachenkova (Aided by T. S. Pashkinaya), Lab Chem of Nitrogen Erch, Inst Biol and Med Chem, Acad Med Sci USSR, Moscow, 17 pp

"Biokhimiya" Vol XIV, No 2

Kynurenine, a chief intermediate product of the dissimilation of levotryptophane, is broken down by kynureninase of the liver and kidneys of

USSR/Medicine - Pyridoxine (Contd) 41/49T43  
Mar/Apr 49

animals and man with formation of anthranilic acid. Established that second product of kynurenine decomposition under action of kynureninase is alanine, formation of which was discovered during action of extracts and cuts of the liver on levo-kynurenine and tissue cuts on levotryptophane. Submitted 22 Nov 48.

PA 41/49T43

41/49T43

РАБОТЫ А. С. ХЕНКОВА, Ye. V.

1/E

Participation of vitamin B<sub>6</sub> in formation of cysteine by  
enzymic transfer of sulfur. A. M. Braunshtein and E. V.  
Goryachikova. Doklady Akad. Nauk S.S.S.R. 96, 886-887  
(1980).—Transfer of S from homocysteine to serine in exts.  
of rat liver is hindered by 60-70% by means of enzymic  
poisons that inactivate or bind carbonyl groups. Even in  
early stages of B<sub>6</sub> avitaminosis the transsulfuration enzymic  
system is severely disrupted, and injection of vitamin B<sub>6</sub>  
restores the function. *In vitro* addn. of phosphopyridoxal  
restores the enzymic function in exts. of rat liver. Thus,  
transfer of S from homocysteine to serine takes place with  
participation of the phosphopyridoxal enzyme.  
(I. M. Komolapoff

11A

Blocking of kynureninase action by amino acids and its significance in pathogenesis of pellagra. E. V. Goryachykh, D. I. Dzhidzhiy. *Doklady Akad. Nauk S.S.S.R.* 80, 643-6 (1951). Cleavage of kynurenine by liver enzymes (rat) in the presence of amino acids was studied *in vitro*. DL-Forms of serine, histidine, and arginine depress the activity of kynureninase even at 0.006 M concn. Only NH<sub>4</sub> ions, glycine, L-asparagine, L-aspartic acid, and L-glutamic acid have no effect; alanine, valine, threonine, methionine, phenylalanine, lysine, arginine, proline, hydroxyproline, and casein hydrolysate showed strong blocking action. The degree of such blocking depends on the relative concns. of kynurenine and the amino acid in case of competition with serine, but in the system with histidine the effect depends solely on concn. of the amino acid. Hence the pellagra effect of corn is caused in part by the blocking of formation of nicotinic acid precursors from 3-hydroxykynurenine caused by amino acids present abundantly in the corn. G. M. Kosolapoff

GA GORYACHENKOVA, YE.V

Biological Chemistry - A  
General - 11

The role of phosphopyridoxal in enzymic formation and cleavage of cystathionine in transsulfuration. E. V. Goryachenkova. Doklady Akad. Nauk S.S.S.R. 83, 1041-6 (1962) - Evidence was obtained which indicates that the condensing enzyme and the thiomase, which operate in cleavage of cystathionine into ketobutyric acid and cysteine and of homocystathionine into pyruvic acid and homocysteine, contain phosphopyridoxal. Liver cuts, from normal and vitamin B<sub>12</sub>-deficient rats in substrates containing L-serine and thiolactone of DL-homocysteine (converted to free acid just before the run) were examined as to activity by following the decline of SH groups and by paper chromatography (PhOH solvent in atm. acid, with HCl and PhOH vapors) using H<sub>2</sub>O<sub>2</sub> detection of S-bearing acids. Further follow-up was obtained by cleavage of cystathionine indirectly by destruction of the condensing enzyme by heat and incubation with active thiomase from normal rat liver. Vitamin B<sub>12</sub>-deficient rat livers show a much lower rate of cystathionine cleavage than normal specimens (25% of normal) paralleling the decline of total transsulfuration. Vitamin B<sub>12</sub>-deficient rat livers show much less active condensation of homocysteine with serine, but addition of 5 γ phosphopyridoxal raises the activity to normal or above normal level. *Streptococcus faecalis* does not form cysteine from cystathionine or from homocysteine + serine; hence thiomase and cysteine desulfhydrase are not identical. G. M. Krasolapoff

INST. Biochemistry im. A.M. Bakh of AS USSR and Lab. of Biophys., Isotopes, and Radiation., AS USSR.

USSR/Biology, Medicine - Antibiotics, 21 Nov 52  
Enzymes

"The Enzyme of Garlic (Allinase) That Forms Alliin  
Is a Phosphopyradoxal Proteid," Ye. V. Gorya-  
chenkova

"Dok Ak Nauk SSSR" Vol 87, No 3, pp 457-460

Allinase catalyzes the formation of alliin  
from alliin. In view of the fact that alliin  
is a beta-substituted alpha-aminoacid with a  
strongly polar substituent in the beta position,

245T2

it may be assumed that the enzyme which splits  
alliin (i.e., allinase) must be a phosphopyro-  
daxal [pyradoxal phosphate] proteid. This  
assumption has been confirmed experimentally.  
Presented by Acad A. I. Oparin 26 Sep 52.

245T2

PA 245T2



USSR/Medicine - Immunology

21 Nov 52

"Determination of the Activity of Highly Purified Tetanus Anatoxin by the Method of Graphic Analysis of Curves Representing Salting Out of Protein Plotted Against Antigen Content," Ye. V. Goryachenkova, Naval Med Acad

"Dok Ak Nauk SSSR" Vol 87, No 3, pp 461-464

Describes the method in question and states that the results obtained by using it on tetanus anatoxin that has been purified to the limit agree with data on the activity of crystalline

245T18

tetanus toxin. One must take into consideration that the anatoxin (as shown by experimental results) contains specific antigen and two other proteins, the solubility of which differs from that of specific antigen. Presented by Acad K. M. Bykov 15 Oct 52.

PA 245T18

245T18

GORYACHENKOVA, E. V.

Effect of deficiency of vitamin B<sub>12</sub> on formation of mercapturic acid and on transsulfuration in the rat. E. V. Goryachenkova, B. Ya. Volovnik, and F. R. Zaidel'man (Inst. Biol. and Med. Chem., Acad. Med. Sci., Moscow). *Doklady Akad. Nauk S.S.S.R.* 93, 111-14 (1953).—Avitaminosis B<sub>12</sub> produced by a diet deficient in this vitamin and contg. about 40% casein was followed by tracing S of S-labeled DL-methionine. Without added methionine the animals excreted about 28.0% of administered PhBr as mercapturic acid in the normal state, and about 23.2% in the B<sub>12</sub>-avitaminotic state, indicating little if any disturbance of formation of mercapturic acid. With addnl. feeding of methionine the figures were 38.5% for controls and 34.0% for test animals, again showing little if any effect of vitamin deficiency. The detn. of radioactivity of total S and cystine S in the protein of all internal organs taken after 24 hrs. following radiomethionine injection showed that both control and the test animals assimilate S at the same rate. However, in shorter expts. (4-6 hrs.) there is a definite decline of active S content in the cystine S of the liver (45-60%) and total protein S (20-40%) of the avitaminotic animals, the results being most pronounced when 60 mg. addnl. methionine was given the animals.

G. M. Kosolapoff

Vol. 93 No. 1

GORYACHENKOVA, E. V.

Chemical Abstracts  
Vol. 48 No. 5  
Mar. 10, 1954  
Biological Chemistry

Activity of the enzyme system of transsulfation in various organs of rats under normal conditions and under B<sub>6</sub> avitaminosis. E. V. Goryachenkova. *Doklady Akad. Nauk S.S.S.R.* 91, 319-20 (1953). The activity of the transsulfation enzyme system in homogenized rat tissues was studied by incubation (anaerobically) with DL-serine and DL-homocysteine, after which the resulting cysteine was detd. (C.A. 43, 2071b; 46, 11268c). The results for liver, kidney, heart, spleen, brain, and skeletal muscle show that normally the S transfer is absent only in brain and skeletal muscles. The enzyme is most active in the spleen, followed by the liver, kidney, and heart. In B<sub>6</sub> avitaminosis the enzymic activity disappears in the heart and almost completely in the liver; in the kidney and spleen it drops by 30-40% of normal. G. M. Kosolapoff.

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184-2

PAK

GORYACHENKOVA, YE.V.

The Committee on Stalin Prizes of the Council of Ministers (USSR) in the fields of science and inventions announces that the following scientific works, popular scientific books, and textbooks have been submitted for competition for Stalin Prizes for the years 1942 and 1943. Sovetskaya Kultura, Moscow, No. 22-43, 20 Feb - 3 Apr 1944.

<u>Name</u>	<u>Title of work</u>	<u>Nominated by</u>
Braunshteyn, A.Ye.	"Investigations of the Processes of Amino Acid Metabolism and the Role of Certain Vitamins of the 'B' Complex in These Processes	Institute of Biological and Medical Chemistry, Academy of Medical Sciences USSR
Shenyakin, M.M.		
Goryachenkova, Ye.V.		
Azarkh, R.M.		
Vilenkia, G.Ya.		

SO: u-30606, 7 July 1944

... KVA EIV

... DG ...  
... from leaves of red clover ...  
... The ... as ...  
... reestablished ...  
... EAD added to the ...

GORYACHENKO, E. V.

The mechanism of action of diamine oxidase (histaminase)

protein as proposed by Werle and Pechmann (C.A. 43, 6706e) in Scheme II. It is concluded that the results of the experiments present evidence insufficient for the correct and complete identification of the protein as proposed in Scheme II and for the proposed

*GORUCHENKOVA, Ye.*  
BEREZOVSKAYA, N.; GORYACHENKOVA, Ye.

Conference on amino acids. Vop.med.khim. 3 no.2:155-158 Mr-Apr '57.  
(AMINO ACIDS) (MLRA 10:7)



USPENSKAYA, V.D., GORYACHENKOVA, Y.O.V., MOGILEVSKAYA, Z.G., POLYAKOVA, V.P.

Electrophoretic purification of diamine oxidase [with summary in English]. Biokhimiia 23 no.2:211-219 Mr-Apr '58 (MIRA 11:6)

1. Institut biologicheskoy i meditsinskoy khimii AN SSSR, Moskva.  
(HISTAMINASE,  
purification by electrophoresis, technic (Rus))

17(3)

AUTHOR:

Goryachenkova, Ye. V.

SOV/20-123-5-36/50

TITLE:

On the Identity of Histaminase and Diaminoxidase  
(Ob identichnosti gistaminazy i diaminoksidazy)

PERIODICAL:

Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 5, pp 898-901 (USSR)

ABSTRACT:

The author gives a survey of publications on the discovery of ferments which render harmless diamines biologically active in animal tissues (Refs 1-4). At first, the presence of one single ferment, diaminoxidase (DO) (Ref 2) was supposed. Later on, however, it was stated (Ref 4) that there were 2 ferments, histaminase and DO. The difference in their actions is constituted by the difference in the oxidation intensities of histamine on the one hand, and of the diamines (putrescine, cadaverine, agmatine) on the other. The author wanted to obtain additional data on the identity mentioned in the title, and studied the following questions: 1) The distribution of activities with regard to histamine and the diamines in the protein fractions of DO from plants and animals; these fractions were purified by the method of electrophoresis; 2) The comparative characteristics of the DO-inactivation (DO from hog kidneys) by iso-nicotinylhydrazide, as well as the reactivation of the apoferment obtained by means of dialysis, by adding phosphorus pyridoxal (vitamin B<sub>6</sub>)

Card 1/3

On the Identity of Histaminase and Diaminoxidase

SOV/20-123-5-36/50

(PhP), with regard to histamine and the diamines. In the present paper it was found that the distribution of the active DO fractions purified by means of electrophoresis, agrees with regard to histamine and the diamines, as far as the length of the column is concerned. DO from hog kidneys is more active with regard to putrescine, whereas DO from pea seedlings oxidizes both histamine and hexamethylene-diamine at about the same velocity. The author has proved that the oxidation of histamine and of the diamines is reduced to an equal extent by the DO-inactivation (from hog kidneys) by means of iso-nicotinyl-hydrazide. On the other hand, it rises to an equal extent on the addition of PhP to the DO-apoferment (produced by the method specified in reference 5). Thus, in the opinion of the author, the identity of DO and histaminase is confirmed.--There are 2 figures, 1 table, and 13 references, 2 of which are Soviet.

ASSOCIATION: Institut biologicheskoy i meditsinskoy khimii Akademii meditsinskikh nauk SSSR (Institute of Biological and Medical Chemistry at the Academy of Medical Sciences of the USSR)

Card 2/3

GORYACHENKOVA, Y. V.

Role of vitamins B<sub>6</sub> and B<sub>2</sub> in the action of diamine oxidase.  
Vitaminy no.4:15-21 '59. (MIRA 12:9)

1. Institut biologicheskoy i meditsinskoy khimii Akademii  
meditsinskikh nauk SSSR, Moskva.  
(DIAMINE OXIDASE) (PYRIDOXINE) (RIBOFLAVIN)

GORYACHENKOVA, YE. V. (USSR)

"The Enzymic Formation of Hydrogen Sulphide from Cysteine in the Liver:"

Report presented at the 5th International Biochemistry Congress, Moscow  
10-16 August 1961

GORYACHENKOVA, Ye.V.

Pathways of enzymatic formation of hydrogen sulfide from  
L-cysteine in the liver. Biokhimiia 26 no.3:541-548 My-Je '61.  
(MIRA 14:6)

1. Institute of Biological and Medical Chemistry, Academy of  
Medical Sciences of the U.S.S.R., and Institute of Radiation and  
Physico-Chemical Biology, Academy of Sciences of the U.S.S.R.,  
Moscow.

(HYDROGEN SULFIDE)  
(CYSTEINE)

(LIVER)

GORYACHENKOVA, Ye.V.

Enzymatic micromethod for determining pyridoxal phosphate and pyridoxamine phosphate. Biokhimiia 28 no.3:565-571 My-Je '63. (MIRA 17:2)

1. Laboratory of Chemical Basis of Biocatalysis, Institute of Radiation and Physico-Chemical Biology, Academy of Sciences of the U.S.S.R., Moscow.

GORYACHENKOVA, Ye.V.; YERSHOVA, E.A.

Study of the substrate specificity and cofactors of diamine  
oxidase from the hog kidneys. Biokhimiya 30 no.1:165-173  
Ja-F '65. (MIRA 18:6)

1. Institut radiatsionnoy i fiziko-khimicheskoy biologii AN  
SSSR, Moskva.



GORYACHEV, A.A., polkovnik; SIDOROV, P.A., polkovnik; CHENTSOV, N.I.,  
redaktor; KONOVALOVA, Ye.K., tekhnicheskiiy redaktor.

[Military regulations on the ethical and combat qualifications  
of a Soviet officer.] Voinskie ustavy o moral'no-boevykh kachestvakh  
sovetskogo ofitsera. Moskva, Voen.fid-vo Ministerstva obor.SSSR,  
1953. 45 p.[Microfilm] (MIRA 9:1)  
(Military education)

GORYACHEV, A.A.; IGNAT'YEV, O.S.; ROGACHEV, D.L.

Synthesis of chkalovite. Dokl. AN SSSR 146 no.5:1179-1181 0 '62.  
(MIRA 15:10)

1. Institut khimii i tekhnologii redkikh elementov i mineral'nogo syr'ya Kol'skogo filiala im. S.M.Kirova AN SSSR.  
(Chkalovite)

GORYACHEV, A. D.

"Experience in Introducing Die Casting"

The Kirov District of Leningrad Strives for Technological Progress; Collection of Articles, Leningrad, Sudpromgiz, 1957. 171pp.

This collection of articles describes the progressive experience of the industrial plants of the Kirov district of the city of Leningrad in the fields of shipbuilding, machine building, instrument-making, casting, hydrolytic and other industries. New manufacturing methods are discussed.

BELOW, A.D., kand. tekhn. nauk; GORYACHEV, A.D., inzh.

Stainless steel with good machinability. Lit. proisv.  
no.11:2-3 N '65. (MIRA 16:12)

L 26031-66 EWT(m)/T/EWP(t) IJP(c) JD/JW

ACC NR:AP6008862

SOURCE CODE: UR/0128/65/000/011/0002/0003

AUTHOR: Belov, A. D. (Candidate of technical sciences); Goryachev, A. D. (Engineer)

ORG: none

TITLE: Easily machinable stainless steels

SOURCE: Liteynoye proizvodstvo, no. 11, 1965, 2-3

TOPIC TAGS: metal machining, stainless steel, sulfur, metal melting, arc furnace, corrosion resistance, metal chemical analysis, steel microstructure, carbon steel

ABSTRACT: S and its analogues Se and Te as well as Pb improve the machinability of stainless steel but Pb, Se and Te are technically inexpedient and hence it is best to apply S and its compounds. However, the introduction of S-treated steels is hindered by the lack of information on the deoxidation of the metal, the conditions for retreating S-treated steel scrap and the methods of treating metal with S. To fill this gap, the authors prepared 40 melts of carbon, chromium and chromium-nickel steels treated with 0.15-0.30% S. Microstructural examination, chemical analysis and mechanical tests of melt specimens established the following. The assimilation of S is optimal (95-100%) if elementary S is added in finely comminuted form during low alloy steel,

Card 1/2

UDC: 621.74:669.14.018.23

L 26031-66

ACC NR: AP6008862

the teeming operation. The steels are of a high quality if the  $\text{FeO}$  content is insignificant (up to 0.007% O). It is expedient to produce S-treated stainless steels in electric arc furnaces with a basic lining in order to remove P. By contrast with the conventional technique, here it must be considered that S is not removed, a high deoxidation of the metal is assured by adding minimal amounts of Si, Mn, Al and calcium-silicon, and S is added in the runner during teeming. Three methods of melting are possible: by using carbon-steel or low-alloy steel scrap, by oxidizing the impurities by means of the  $\text{O}_2$  of the ore or by blowing  $\text{O}_2$  through the melt under pressure, or by using retreat scrap subjected to  $\text{O}_2$  blowing and remelting without oxidation. The machining of the steels thus produced reduces the wear on cutting tools 2.5-4 times compared with conventional steels, increases the cutting rate 1.5-2 times and reduces the cutting stress 25%. The corrosion resistance of such steels is as high as that of conventional steels. Orig. art. has: 3 tables.

SUB CODE: 11, 13 / SUBM DATE: none

Card 2/2

PB

MASLOV, V.S.; GORYACHEV, A.G.; SUVOROV, V.N.

Device for cutting irregularly shaped windshields. Stek.1 kor.  
17 no.4:37-38 Ap '60. (MIRA 13:8)

(Glass cutting)

(Automobiles—Windows and windshields),

GORYACHEV, A.I.

"Investigation of Noise in Lead Sulfide Photoresistors," by  
A. I. Goryachev and K. A. Yumatov, Radiotekhnika i Elektron-  
ika, No 12, Dec 56, pp 1503-1514

Determination of photoresistor characteristics is one of great practical importance, because photoresistors are now widely used for measurement of small values of radiant energy.

Lead sulfide photoresistors were examined for the relationship between internal noises and applied voltage, load, field intensity, dark resistance, frequency, and magnitude of photocurrent. The experiment disclosed that photoresistors possess greatest sensitivity when the value of the dark resistance is the least; this is also true in respect to internal noises.

This report was delivered at the All-Union Conference on Semiconductors, Leningrad, November 1955.

54M-1305



GORYACHEV, A. I.

"The Petrography of the Triassic Deposits Near the South Urals," Dokl. AN  
SSSR, 68, No.3, 1949

3(5)

P. 3.

PHASE I BOOK EXPLOITATION

SOV/2219

RSFSR. Glavnoye upravleniye geologii i okhrany nedr

Geologiya i neftegazonosnost' Vostochnoy Sibiri (Geology and Oil- and Gas-bearing Possibilities of Eastern Siberia) Moscow, Gostop-tekhizdat, 1959. 486 p. 1,650 copies printed.

Additional Sponsoring Agency: Vostochno-Sibirskiy neftegeologicheskiy trest.

Ed.: V.G. Vasil'yev; Executive Ed.: Ye.G. Pershina; Tech. Ed.: I.G. Fedotova.

PURPOSE: The book is intended for geologists interested in the stratigraphy, lithology, tectonics, and the oil- and gas-bearing possibilities of the Eastern Siberian platform and Zabaykal'ye.

COVERAGE: This collection of articles contains materials on the stratigraphic classification and lithologic characteristics of sediments of the Cambrian system and of the so-called "ancient" beds developed along the northern slope of the Eastern Sayan Mountains and

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SOV/2219

# Geology and Oil- and Gas-bearing (Cont.)

the western littoral of Lake Baykal. Extensive information on the petrography and paleontology of these deposits is presented. A number of articles deal with the tectonics of the southern part of the Siberian platform and its oil- and gas-bearing possibilities of the Baykal-type depressions. There are 40 tables, 74 figures, and 4 charts. There are 205 Soviet references.

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Geology and Oil- and Gas-bearing (Cont.)

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Geology and Oil- and Gas-bearing (Cont.)

SOV/2219

Kononov, A.I. New Data on the Tectonics of the Southeastern  
Part of the Siberian Platform

356

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435

Vasil'yev, V.G., S.N. Gushkovich, and E.N. Lishnevskiy. The  
Problem of Interpreting Gravimetric and Magnetic Data for  
the Southern Part of the East Siberian Platform

475

Paleontologic Plates

489

AVAILABLE: Library of Congress

MM/ad  
8-20-59

Card 4/4

GORYACHEV, A.M.

Use of large-size brick blocks in the construction of railroad  
depots. Stroi. prom. 33 no. 4:10-12 Ap '55. (MIRA 8:6)  
(Railroads--Stations) (Walls)

CO

9

Aluminum welding with "Alukol" solders. A. P. GURVACHY, K. R. SUTOMYAT-  
NIKOV AND E. V. TIRKHOVITZER. *Sovetskoye Priblizheniya k Metal. 1931*,  
Nos. 5 6, 57 63. — "Alukol" solders nos 2 and 3 are about the same. The best solder  
in regard to mech. strength and resistance to corrosion is no 4. Coating the Al with  
solder no 1 (Pb + Sn), before applying no 4, lowers considerably the mech. strength  
and resistance to corrosion of the joint; therefore, this method is not recommended.  
S. I. MASHKOV

ASW-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

Electric welding of aluminum by means of carbon electrodes. A. P. GORVACHIN  
AND R. R. SUDOMYATNIKOV. *Aviatsionnaya Tekhnika* 1951, No. 6, 68. A flux consisting of NaCl  
70, KCl 65.1 and LiCl 27.3% was found to be very suitable for the work described in  
the preceding abstr. A. A. HORITLINOK

AVIATION METALLURGICAL LITERATURE CLASSIFICATION



9

Thick-coated electrodes for steel welding. A. P. GORYACHEV, N. M. NIKITINICH AND G. J. MART'YANOV. *Repts. Inst. Metals, Leningrad* 1933, No. 13, 107-21 (in German 122). In the elec. welding of low-C steel it is important to have a sufficient amt. of deoxidizing and degassing materials and also of molten slag to protect the weld from oxidation. This is accomplished by having a thick coat of deoxidizer and degassing agent on the Fe electrodes, instead of a thin coat as is usually practiced. The best results were obtained with an electrode coat having the following compn.: 1-1.4% Al<sub>2</sub>O<sub>3</sub>, 23-33.0% Fe<sub>2</sub>O<sub>3</sub>, 50.4-64% pyrolusite (MnO<sub>2</sub>, SiO<sub>2</sub> 20, CaO 4%), and 13-15% CaO. The materials were ground to a fine powder, made into a paste with liquid Na<sub>2</sub>SiO<sub>3</sub> 20% H<sub>2</sub>O, and the paste was put on the electrodes, 0.5 mm. thick for a 3 mm. rod and 1 mm. thick for 4.0 mm. rod. The electrodes were then dried and finally heated for 1-2 hrs. at 150-200°. Such electrodes can be used for welding steel containing up to 0.3% C.

S. L. MAJORSKY

PHASE I BOOK EXPLOITATION SOV/3699

Goryachev, A.P., S.M. Yegorov, I.S. Fatiyev, and V.A. Semenov

Argono-dugovaya svarka i payka titana (Argon Arc Welding and Soldering of Titanium), Leningrad, 1957. 34 p. (Series: Informatsionno-tekhnicheskiy listok, No. 80-81. Svarka i payka metallov) 6,200 copies printed.

Ed.: Z.M. Ryzhik, Engineer; Tech. Ed.: T.B. Klopova.

PURPOSE: This book is intended for welders.

COVERAGE: Manual and automatic methods of welding titanium with and without filler metal are explained. Soldering and brazing methods are discussed and fluxes and protective gases are described. There are 11 references: 7 Soviet, and 4 English.

TABLE OF CONTENTS: None given [book divided as follows].

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VK/gmp  
6-7-60

137-58-4-7283

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 4, p 139 (USSR)

AUTHOR: Goryachev, A. P.

TITLE: Welding Titanium (Svarka titana)

PERIODICAL: V sb.: Svarochnoye proiz-vo. Leningrad, Lenizdat, 1957, pp 64-76

ABSTRACT: The article investigates the technology of manual and automatic welding of technical Ti in a medium of inert gases using W- and fusing electrodes. It was found that with a current  $I=280a$ , welding speed  $v=200-250$  mm/min, diameter of the torch jet 12 mm, and a content of 0.27 per cent  $N_2$  and 0.05 per cent  $O_2$  in Ar, the best conditions for protecting the Ti from the surrounding atmosphere are ensured with an Ar consumption of 12-20 liters/min. By increasing the consumption of Ar the hardness of the joint and the quantity of O and N in it are increased. An increase of  $v$  has a favorable effect. Large linear arc energies can cause overheating of the liquid metal and formation of pores in the joint. The composition of the protective gas affects the voltage  $U$  on the arc and the width of the fusion zone. Thus, in welding with a W-electrode with  $I=200a$ ,  $v=150$  mm/min and a gas consumption of 27 liters/min a change in the Ne content of Ar from 0 to 75 per cent causes an increase in the fusion zone from 7.5 mm to

Card 1/3

## Welding Titanium

137-58-4-7283

10 mm and an increase in U from 11v to 13v (arc length 2 mm) and from 15v to 18v (arc length 8 mm). The welding wire must contain  $\leq 0.05$  per cent O, 0.04 per cent N, 0.001 per cent H, and 0.1 per cent C. The more plastic the wire, the more plastic the metal of the joint. For increasing the plasticity of the joint it is necessary to degasify the welding wire in a vacuum of 10-3 mm Hg at 850°-900° C for 5-6 hours in order to eliminate H. Degasification of the wire increases the  $\sigma$  of the joint from 2.3 - 3.5 to 7.9 kg/cm<sup>2</sup>. The welding of titanium lends itself readily to mechanization. Without a welding wire this can be accomplished on Cu or Ti blocks up to 3 mm thick on one side and up to 6 mm thick on two sides. Moreover, there is no reduction of joint cross-section in comparison with the thickness of the plates. For welding thicknesses  $> 6$  mm the edges are separated and a welding wire is used. Use of a wire with diameter  $\leq 1.5-2$  mm ensures a uniform flow of the liquid metal through the arc with minimum splash. The smoothest transition from the facing metal to the parent metal occurs when welding with reversed polarity. With a welding speed of 22 m/hr and a gap of 18-20 mm, a change in current from 160a to 230a causes an increase in the fusion depth of the parent metal from 0.8 mm to 3.2 mm. Examples of preparing welded constructions from titanium are given: a conduit 88 m in diameter, a screw propeller,

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Welding Titanium

a gas cylinder, a kerosene tank, an air pressure cylinder to sustain 60 kg/cm<sup>2</sup>, and a tubular welded assembly.

1. Titanium--Welding 2. Welding--Equipment

V.S.

Card 3/3

Gok yachev, A.D.

25(1) PHASE I BOOK EXPLOITATION NOV/2050

Svarsha sbornik state, [typ] 1 (Welding; Collection of Articles, Br. 1) Leningrad, Svydprogiz, 1958. 244 p. 3,000 copies printed.

Naup. M.; O. I. Kopyrin, Candidate of Technical Sciences; M. I. A. Zhuravskaya, Tech. Ed.; A. N. Volchok.

PURPOSE: This collection of articles is intended for use in research institutes, institutes of higher learning, design offices, and plants.

CONTENTS: These technical papers deal with the results of research in welding technology. The main purpose of this work was to investigate the effects of various welding regimes and heat treatments on the mechanical properties of welds of austenitic and ferritic composition. A number of experiments also dealt with the weld properties and weldability of titanium-base alloys and a number of different metals. One of the objects of the research was to establish the relationship between the geometry of the weld seam and its physical properties. The crystallization of the weld, its mechanical properties, and the various factors affecting the grain structure of the metal were studied by a number of authors. A special practical interest is the study of the behavior of welds in the structure in which the elasticity of the material and of the welds are not within the same range. These considerations lead to expectations that with further technical changes in the properties of the weld seam, another problem which presents many difficulties in welding is the behavior and changes in the heat-affected zone next to the welded joint. One of the papers deals with experiments in this field. A description is given of the equipment and the technique used in electroslag welding, which is regarded as one of the major advances in modern welding technology. Several papers deal with welding techniques of non-ferrous alloys and with the use of special fluxes for this work. Most of the papers are profusely illustrated with graphs, diagrams, and photographs. References are given after each article.

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GORBATCHEV, A. P.  
TRET'YAKOV, F. Ye. and SHORSHCROV, M. Kh. (Candidates of Technical Sciences)  
GORVATCHEV, A. P. and POLYAKOV, D. A. (Engineers)

"Wwelding of Titanium,"

paper presented at All-Union Scientific-Technical Conference on Welding in  
Shielding Gases, LLeinengrad, Dec 1957.

(Svarochnoye Proizvodstvo, 1958, No. 4, pp 46-47 - author Tyul'kov, M. D.)

GORVACHEV, H. P.

BOOK 1 BOOK REPRODUCTION NOV/5/73

Shvets, Lev Golemovich, Doctor of Technical Sciences, Professor Boris Borisovich  
Chernitsin, Yev Vasil'yevich Polig, Boris Vladimirovich Belyakov, Semily  
Mikheyevich Shal'vits, and Aleksandr Nikolayevich Goryachev  
Title 1 page (plenty) Item 1: Tekhnicheskii chisty listy (Technical and Tool Alloys,  
Vol. 1) Commercially Pure Titanium) Leningrad, Sudpromgiz, 1960. 515 p.  
Kreish also illustrated. 4,500 copies printed.

Ed. (Title page): L.G. Shvets; Ed. (Inside book): Z.V. Tlasonov; Tech. Ed.: E.V.  
Kreish.

REMARKS: This book is intended for scientific workers, plant engineers, and  
students in advanced courses in schools of higher technical education and  
engineers (with the exception of mechanical engineers).

CONTENTS: The book presents data on the structure, phase transformation, and  
physicochemical and processing properties of commercially pure titanium.

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### **Therium and Its Alloys (Cont.)**

DISC 5

Shop-crafting, process technology, plastic deformation, welding, and soldering and brazing processes for titanium. The following information is given to problems of constitutional strength and plastic deformation processes. Chapter 3, B.S. Chemsak wrote sections 2.5, 2.6, and sections 1, 4, and 5 and 6 of Chapter 3, and Chapters 4 and 9. I.V. Palla wrote sections 2.7, 2.8, 2.9, 2.10, 2.11, 2.12, 2.13, 2.14, 2.15, 2.16, 2.17, 2.18, 2.19, 2.20, 2.21, 2.22, 2.23, 2.24, 2.25, 2.26, 2.27, 2.28, 2.29, 2.30, 2.31, 2.32, 2.33, 2.34, 2.35, 2.36, 2.37, 2.38, 2.39, 2.40, 2.41, 2.42, 2.43, 2.44, 2.45, 2.46, 2.47, 2.48, 2.49, 2.50, 2.51, 2.52, 2.53, 2.54, 2.55, 2.56, 2.57, 2.58, 2.59, 2.60, 2.61, 2.62, 2.63, 2.64, 2.65, 2.66, 2.67, 2.68, 2.69, 2.70, 2.71, 2.72, 2.73, 2.74, 2.75, 2.76, 2.77, 2.78, 2.79, 2.80, 2.81, 2.82, 2.83, 2.84, 2.85, 2.86, 2.87, 2.88, 2.89, 2.90, 2.91, 2.92, 2.93, 2.94, 2.95, 2.96, 2.97, 2.98, 2.99, 3.00, 3.01, 3.02, 3.03, 3.04, 3.05, 3.06, 3.07, 3.08, 3.09, 3.10, 3.11, 3.12, 3.13, 3.14, 3.15, 3.16, 3.17, 3.18, 3.19, 3.20, 3.21, 3.22, 3.23, 3.24, 3.25, 3.26, 3.27, 3.28, 3.29, 3.30, 3.31, 3.32, 3.33, 3.34, 3.35, 3.36, 3.37, 3.38, 3.39, 3.40, 3.41, 3.42, 3.43, 3.44, 3.45, 3.46, 3.47, 3.48, 3.49, 3.50, 3.51, 3.52, 3.53, 3.54, 3.55, 3.56, 3.57, 3.58, 3.59, 3.60, 3.61, 3.62, 3.63, 3.64, 3.65, 3.66, 3.67, 3.68, 3.69, 3.70, 3.71, 3.72, 3.73, 3.74, 3.75, 3.76, 3.77, 3.78, 3.79, 3.80, 3.81, 3.82, 3.83, 3.84, 3.85, 3.86, 3.87, 3.88, 3.89, 3.90, 3.91, 3.92, 3.93, 3.94, 3.95, 3.96, 3.97, 3.98, 3.99, 4.00, 4.01, 4.02, 4.03, 4.04, 4.05, 4.06, 4.07, 4.08, 4.09, 4.10, 4.11, 4.12, 4.13, 4.14, 4.15, 4.16, 4.17, 4.18, 4.19, 4.20, 4.21, 4.22, 4.23, 4.24, 4.25, 4.26, 4.27, 4.28, 4.29, 4.30, 4.31, 4.32, 4.33, 4.34, 4.35, 4.36, 4.37, 4.38, 4.39, 4.40, 4.41, 4.42, 4.43, 4.44, 4.45, 4.46, 4.47, 4.48, 4.49, 4.50, 4.51, 4.52, 4.53, 4.54, 4.55, 4.56, 4.57, 4.58, 4.59, 4.60, 4.61, 4.62, 4.63, 4.64, 4.65, 4.66, 4.67, 4.68, 4.69, 4.70, 4.71, 4.72, 4.73, 4.74, 4.75, 4.76, 4.77, 4.78, 4.79, 4.80, 4.81, 4.82, 4.83, 4.84, 4.85, 4.86, 4.87, 4.88, 4.89, 4.90, 4.91, 4.92, 4.93, 4.94, 4.95, 4.96, 4.97, 4.98, 4.99, 5.00, 5.01, 5.02, 5.03, 5.04, 5.05, 5.06, 5.07, 5.08, 5.09, 5.10, 5.11, 5.12, 5.13, 5.14, 5.15, 5.16, 5.17, 5.18, 5.19, 5.20, 5.21, 5.22, 5.23, 5.24, 5.25, 5.26, 5.27, 5.28, 5.29, 5.30, 5.31, 5.32, 5.33, 5.34, 5.35, 5.36, 5.37, 5.38, 5.39, 5.40, 5.41, 5.42, 5.43, 5.44, 5.45, 5.46, 5.47, 5.48, 5.49, 5.50, 5.51, 5.52, 5.53, 5.54, 5.55, 5.56, 5.57, 5.58, 5.59, 5.60, 5.61, 5.62, 5.63, 5.64, 5.65, 5.66, 5.67, 5.68, 5.69, 5.70, 5.71, 5.72, 5.73, 5.74, 5.75, 5.76, 5.77, 5.78, 5.79, 5.80, 5.81, 5.82, 5.83, 5.84, 5.85, 5.86, 5.87, 5.88, 5.89, 5.90, 5.91, 5.92, 5.93, 5.94, 5.95, 5.96, 5.97, 5.98, 5.99, 6.00, 6.01, 6.02, 6.03, 6.04, 6.05, 6.06, 6.07, 6.08, 6.09, 6.10, 6.11, 6.12, 6.13, 6.14, 6.15, 6.16, 6.17, 6.18, 6.19, 6.20, 6.21, 6.22, 6.23, 6.24, 6.25, 6.26, 6.27, 6.28, 6.29, 6.30, 6.31, 6.32, 6.33, 6.34, 6.35, 6.36, 6.37, 6.38, 6.39, 6.40, 6.41, 6.42, 6.43, 6.44, 6.45, 6.46, 6.47, 6.48, 6.49, 6.50, 6.51, 6.52, 6.53, 6.54, 6.55, 6.56, 6.57, 6.58, 6.59, 6.60, 6.61, 6.62, 6.63, 6.64, 6.65, 6.66, 6.67, 6.68, 6.69, 6.70, 6.71, 6.72, 6.73, 6.74, 6.75, 6.76, 6.77, 6.78, 6.79, 6.80, 6.81, 6.82, 6.83, 6.84, 6.85, 6.86, 6.87, 6.88, 6.89, 6.90, 6.91, 6.92, 6.93, 6.94, 6.95, 6.96, 6.97, 6.98, 6.99, 7.00, 7.01, 7.02, 7.03, 7.04, 7.05, 7.06, 7.07, 7.08, 7.09, 7.10, 7.11, 7.12, 7.13, 7.14, 7.15, 7.16, 7.17, 7.18, 7.19, 7.20, 7.21, 7.22, 7.23, 7.24, 7.25, 7.26, 7.27, 7.28, 7.29, 7.30, 7.31, 7.32, 7.33, 7.34, 7.35, 7.36, 7.37, 7.38, 7.39, 7.40, 7.41, 7.42, 7.43, 7.44, 7.45, 7.46, 7.47, 7.48, 7.49, 7.50, 7.51, 7.52, 7.53, 7.54, 7.55, 7.56, 7.57, 7.58, 7.59, 7.60, 7.61, 7.62, 7.63, 7.64, 7.65, 7.66, 7.67, 7.68, 7.69, 7.70, 7.71, 7.72, 7.73, 7.74, 7.75, 7.76, 7.77, 7.78, 7.79, 7.80, 7.81, 7.82, 7.83, 7.84, 7.85, 7.86, 7.87, 7.88, 7.89, 7.90, 7.91, 7.92, 7.93, 7.94, 7.95, 7.96, 7.97, 7.98, 7.99, 8.00, 8.01, 8.02, 8.03, 8.04, 8.05, 8.06, 8.07, 8.08, 8.09, 8.10, 8.11, 8.12, 8.13, 8.14, 8.15, 8.16, 8.17, 8.18, 8.19, 8.20, 8.21, 8.22, 8.23, 8.24, 8.25, 8.26, 8.27, 8.28, 8.29, 8.30, 8.31, 8.32, 8.33, 8.34, 8.35, 8.36, 8.37, 8.38, 8.39, 8.40, 8.41, 8.42, 8.43, 8.44, 8.45, 8.46, 8.47, 8.48, 8.49, 8.50, 8.51, 8.52, 8.53, 8.54, 8.55, 8.56, 8.57, 8.58, 8.59, 8.60, 8.61, 8.62, 8.63, 8.64, 8.65, 8.66, 8.67, 8.68, 8.69, 8.70, 8.71, 8.72, 8.73,

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